Operations Plan

for the
GOES-R Proving Ground
portion of the
Aviation Weather Experiment
conducted at the
Aviation Weather Center

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Product developers contributed the material regarding their respective products.

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1 Introduction

1.1 Plan Purpose and Scope

The Aviation Weather Experiment provides the GOES-R Proving Ground (PG) with a pre-operational environment in which to deploy and demonstrate algorithms associated with its next generation GOES-R geostationary satellite system. These products are to include both GOES-R baseline products and operational readiness trials of products transitioning from Risk Reduction, but with the main focus on demonstrating the official GOES-R Baseline and Option-2 products. The availability of GOES-R products will demonstrate, pre-launch, a portion of the full observing capability of the GOES-R system, subject to the constraints of existing high latitude data sources to emulate the satellite sensors.

1.2 Overview

The Aviation Weather Proving Ground will focus on providing GOES-R aviation related products to the Aviation Weather Center (AWC). The AWC in Kansas City, MO will receive early exposure to GOES-R PG products during the Experiment running from December 2010 through May 2011. Pre-operational demonstrations of these GOES-R PG data will provide the aviation forecasters the opportunity to critique and improve the products relatively early in their development.

2 Goals of Proving Ground Project

The Aviation Experiment will focus on demonstrating the GOES-R products selected for this year's activities including convective initiation, volcanic ash, SO2 detection, aircraft icing threat and low cloud and fog. One additional risk reduction product will also be demonstrated at the AWC, the Nearcasting Model. This strategy has the best chance of maximizing the Operations-to-Research feedback that is one of the PG goals. An important aspect of the interactions is to build relationships between each key product development team and the forecasters within the aviation community. Thus, the forecasters will participate in the experimental activities and discussions (in particular regarding satellite-based products) and provide feedback to improve integration of GOES-R PG effort in these test bed activities for future years.

3 GOES-R product(s) to be demonstrated

There are four GOES-R products from the Advanced Baseline Imager (ABI) identified to be demonstrated during the Aviation Weather Experiment: (1) Volcanic Ash: Detection and Height, (2) Aircraft Icing Threat, (3) Low Cloud and fog, and (4) SO2 Detection. Additionally, the Spring Experiment will also demonstrate GOES-R Risk Reduction (R3) and GOES I/M Product Assurance Plan (GIMPAP) products such as the University of Wisconsin Convective Initiation (UWCI), and Ralph Peterson's Nearcasting model. These products are listed in Table 1 and described further in the following subsections.

Table 1. Products to be demonstrated during Experiment

Demonstrated Product	Category
Volcanic Ash: Detection and Height	Baseline
Aircraft Icing Threat	Baseline
Low Cloud and Fog	Baseline

Demonstrated Product	Category
SO_2 Detection	Baseline
Nearcasting Model	GOES-R Risk Reduction
Convective Initiation (UW)	GIMPAP
Category Definitions: **Baseline Products** - GOES-R products that are funded for operational implementation as part of the ground segment base contract. **GIMPAP** - The GOES Improved Measurement and Product Assurance Plan provides for new or improved products utilizing the current GOES imager and sounder	

3.1 Volcanic Ash

The GOES-R volcanic ash algorithm utilizes infrared channels (7.3, 8.5, 11, 12, and 13.3 μm) to identify potential volcanic ash clouds (when the ash is the highest cloud layer) and to retrieve the ash cloud height, mass loading, and effective particle radius. These parameters are important for both nowcasting and forecasting purposes. The ash cloud height is needed to determine if ash is at cruising altitudes and to initialize the plume height in dispersion models. The GOES-R ash cloud height retrieval accounts for transmission of radiation through the ash cloud from below (e.g. the ash clouds are allowed to be semi-transparent to infrared radiation), so it produces high quality results even when applied to optically thin ash clouds. Validation efforts indicate that the GOES-R ash height retrieval can determine the ash cloud top height with an accuracy (bias) of -1.35 km and a precision of 1.61 km, for tropospheric clouds.

Ash concentration data are needed to determine if jet engine tolerances are exceeded (should accurate thresholds be made available by engine manufacturers). If a 1 km ash cloud thickness is assumed, the ash mass loading (ton/km^2) is numerically equivalent to ash concentration in mg/m^3. Ash loading data can also be used to initialize models. Comparisons to spaceborne lidar indicate that the GOES-R ash mass loading has an accuracy (bias) of 0.42 ton/km^2 and a precision of 1.17 ton/km^2, subject to certain microphysical assumptions.

The ash effective particle radius is not an official GOES-R requirement, but it is automatically produced in the process of retrieving the ash height and mass loading. The ash effective particle radius can be used to determine if the ash cloud is dominated by small or large particles, which is important for predicting the atmospheric residence time (small particle remain suspended longer than large particles, all else being equal). This information can also be used to initialize models. Since it is not an official GOES-R product, the ash effective particle radius information will be retained in the quality flag output.

The GOES-R volcanic ash algorithm can be applied to data from the Moderate Resolution Imaging Spectroradiometer (MODIS), which is in a low-earth orbit, and, as such, provides coverage of Alaska. Example GOES-R volcanic ash products are shown in the figure below for an Alaskan eruption (Kasatochi).

Finally, it is important to point out that while the GOES-R volcanic ash products meet all of the accuracy and latency specifications, the ash detection component of the GOES-R algorithm is not designed to be used in an automated ash alert system (the GOES-R requirements did NOT include an automated alert capability). In recognition of this shortcoming, a GOES-R automated alert capability will be developed in the coming months. This capability will be a more advanced version of the automated alert capability developed for the Advanced Very High Resolution Radiometer (AVHRR). The GOES-R automated alert system will hopefully be available for testing under the GOES-R Proving Ground in 2011 or 2012.

Questions concerning the GOES-R volcanic ash products can be sent to:
Mike.Pavolonis@noaa.gov

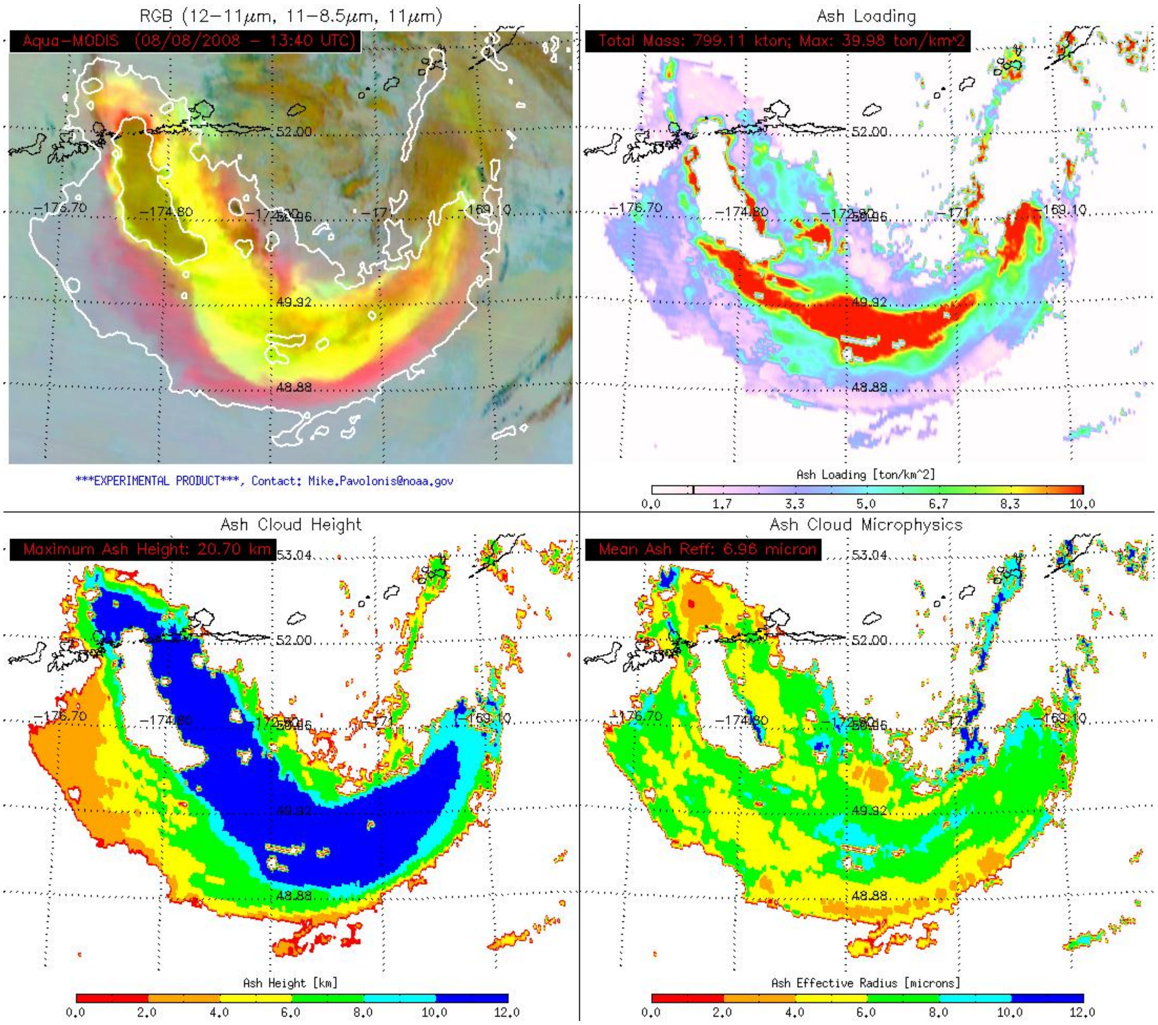

Figure 1: Example GOES-R volcanic ash products generated using *Aqua* MODIS data from August 8, 2008 at 13:40 UTC. The ash cloud present in this scene is from an eruption of Kasatochi, located in the Aleutian Islands of Alaska. A false color image (top left panel), the ash mass loading product (top right panel), the ash height product (bottom left panel), and the ash effective radius product (bottom right panel) are shown. The ash detection results are displayed as white contours on the false color image.

3.2 Aircraft Icing Threat

The Aircraft Icing Threat is partially determined by the presence and density of super-cooled liquid water (SLW) and the water droplet size distribution. The GOES-R Aircraft Icing Threat algorithm utilizes satellite-derived cloud properties that provide information on icing conditions. The product is available at the pixel level and composed of three components; (1) the icing mask available day and night which discriminates regions of possible aircraft icing, (2) the icing probability, estimated during the daytime only, and (3) a two-category intensity index which is also derived during the daytime only. The icing mask is developed using GOES-R derived cloud thermodynamic phase, cloud top temperature and cloud optical thickness products to identify which cloudy pixels contain significant SLW. Optically thick clouds composed of ice crystals at cloud top may obscure possible icing conditions from the satellite view and in such cases the icing threat is deemed to be unknown from the GOES-R data alone. During the daytime, the probability (low, medium, or high) of encountering icing and the intensity category [light (LGT), or moderate or greater (MOG)] are determined using the liquid water path and effective droplet size products. Larger droplets and liquid water paths are associated with a higher probability of more severe icing. In the current algorithm, the MOG category always has a high probability of icing due to its strong dependence on liquid water path. An example of the product derived from current GOES is shown below, along with Pilot reports (PIREPS) of icing which confirm the

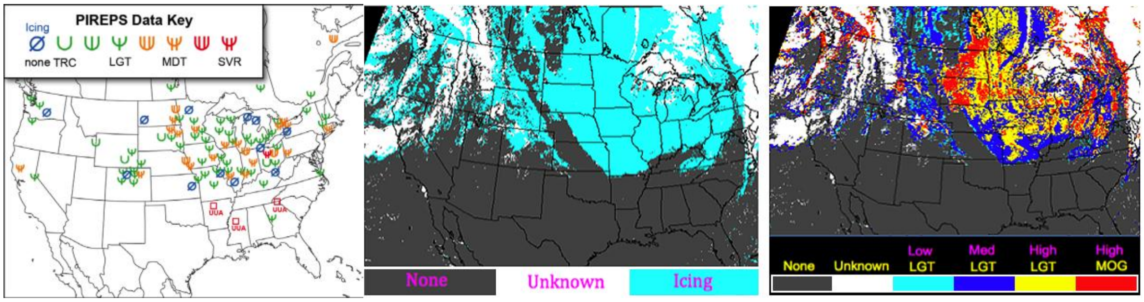

Figure 4: ***Left: Icing PIREPS on Nov. 8, 2008. The Flight Icing Threat icing mask (Center) and icing intensity (Right) are shown, derived from current GOES at 1745 UTC on Nov. 8, 2008. Icing intensity is expressed as the probability of encountering light (LGT) or moderate or greater (MOG) icing.***

aircraft icing threat. The GOES-R Aircraft Icing Threat product will be particularly helpful in resolving the small-scale areas of intense icing often missed in other products. There are many difficulties associated with validating the product and feedback from the user community is sorely needed. Forecasters at the National Center for Atmospheric Research (NCAR) have successfully used the product to direct aircraft into intense areas of icing for basic research and for icing certification purposes. Icing PIREPS provide the most widely available in-situ aircraft icing information and have been used extensively in developing and validating the GOES-R Aircraft Icing Threat product. The skill in detecting icing conditions reported by Pilot's (PODY) is better than 90% provided there are no high level clouds obscuring the satellite view. Because Pilot's lack the incentive to report 'no icing' conditions, as well as other issues, accurately quantifying false alarms has thus far been difficult to achieve.

Questions concerning the GOES-R Aircraft Icing Threat product can be sent to:
William.L.Smith@nasa.gov

3.3 Low Cloud and Fog

The GOES-R fog/low cloud detection product is designed to quantitatively identify clouds that produce Instrument Flight Rules (IFR) or Low Instrument Flight Rules (LIFR) conditions (ceiling < 1000 ft (305 m)). The aviation flight rule categories are defined in the table below. The GOES-R fog detection is expressed as a probability. At night, the algorithm utilizes the 3.9 and 11 μm channels to assign a fog probability. Fog probability during the day is determined using the 0.65, 3.9, and 11 μm channels. The fog probability is based on textual and spectral information, as well as the difference between the cloud radiative temperature and surface temperature. An example of the GOES-R fog product is shown in the figure below.

Table 1: Aviation flight rules

Flight Rule	**Ceiling**
Visual Flight Rules (VFR)	> 3000 ft (914 m)

Marginal Visual Flight Rules (MVFR)	1000 ft (305 m) – 3000 ft (914 m)
Instrument Flight Rules (IFR)	500 ft (152 m) – 1000 ft (305 m)
Low Instrument Flight Rules (LIFR)	< 500 ft (152 m)

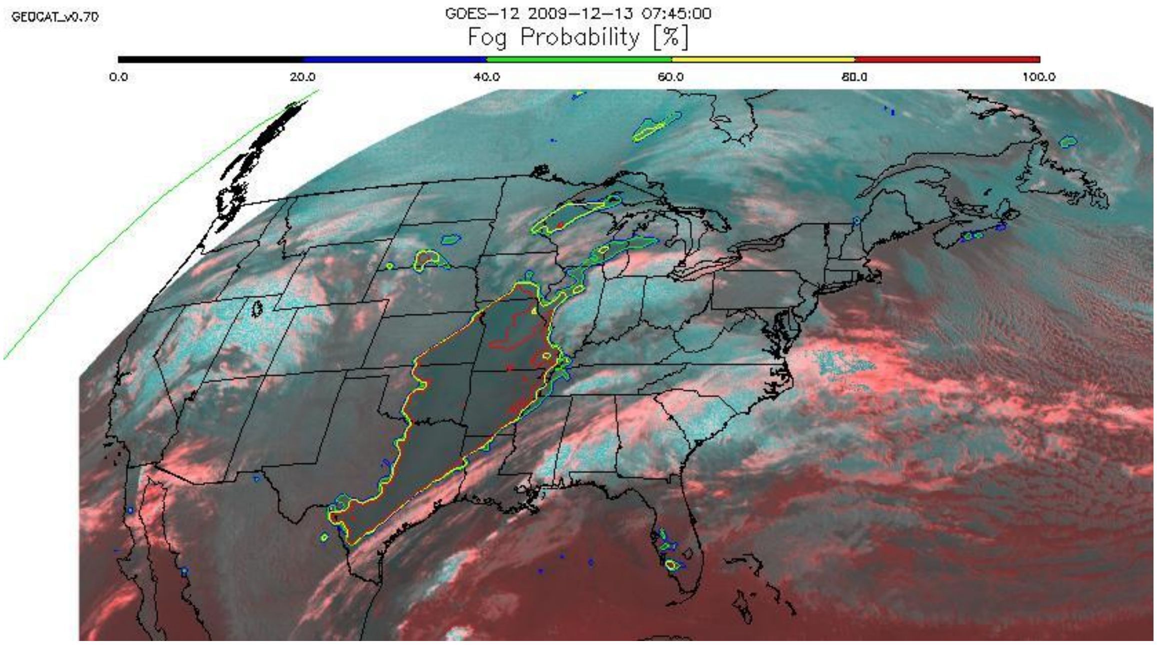

Figure 4: An example of the GOES-R fog detection product generated using GOES-12 on December 13, 2009 at 07:45 UTC. The satellite derived fog probability is denoted by the color contours overlaid on the false color image.

There are a few important caveats that users need to be aware of. Fog cannot be detected if there are higher cloud layers overlapping the fog layer. The GOES-R fog/low cloud product specifications reflect this fundamental limitation of passive remote sensing. Secondly, passive satellite measurements do not provide direct information on cloud base or ceiling, so the properties of the cloud layer actually sensed by the radiometer must be used to indirectly infer information on cloud base. Since the properties of the cloud base are not directly measured, variations in cloud base due to local boundary layer effects (e.g. local moisture sources/sinks and local turbulent mixing processes) generally will not be captured. As such, not every surface observation underneath a GOES-R detected low cloud will necessarily indicate a ceiling of 1000 ft or lower, but those surface observations that do not indicate LIFR or IFR will generally indicate Marginal Visual Flight Rules (MVFR) conditions. In other words, the GOES-R fog/low cloud algorithm will rarely identify Visual Flight Rules (VFR) conditions, which is desirable.

The GOES-R fog/low cloud detection algorithm is required to achieve a skill score (probability of detection – probability of false alarm) of 0.70. Validation efforts indicate that we are on track to meet this specification.

Finally, while the GOES-R fog product requires output from the cloud mask and cloud top phase algorithms, which will be most accurate when applied to the ABI or a comparable sensor, it can be generated using the current GOES imager, MODIS, SEVIRI, or MTSAT.

Questions concerning the GOES-R fog/low cloud product can be sent to:
Mike.Pavolonis@noaa.gov

3.4 SO_2 Detection

Identifying SO_2 clouds is important, since SO_2, when combined with water, is corrosive and harmful to breath, and, as such, is a potential aviation hazard. Further, when injected into the stratosphere, SO_2 is converted to sulfate droplets, which reflect incoming sunlight back to space, impacting climate.

The GOES-R SO_2 detection product utilizes infrared measurements (6.2, 7.3, 8.5, 11, and 12 μm) to identify pixels that contain 10 or more Dobson Units (DU) of Sulfur Dioxide (SO_2), when the SO_2 cloud is the highest cloud layer. The SO2 detection algorithm utilizes a unique blend of spectral and spatial information to detect SO_2. SO_2 loadings less than 10 DU are difficult to detect using the Advanced Baseline Imager (ABI), since the ABI cannot resolve individual SO_2 absorption lines. Validation efforts indicate that the SO_2 detection algorithm meets the GOES-R accuracy specification (70% correct detection). More specifically, the probability of detection is ~70% and the probability of false alarm is ~0%. The low false alarm rate makes this product ideal for use in an automated volcanic cloud alert system. In addition, while not required, the SO_2 loading is also estimated using a simple regression relationship. Since the SO_2 loading is not a required product, the loading information will be stored in the quality flags.

The GOES-R SO_2 algorithm can be applied to data from the Moderate Resolution Imaging Spectroradiometer (MODIS), which is in a low-earth orbit, and, as such, provides coverage of Alaska. Example GOES-R SO_2 products are shown in the figure below for an Alaskan eruption (Kasatochi).

Questions concerning the GOES-R SO_2 product can be sent to: Mike.Pavolonis@noaa.gov

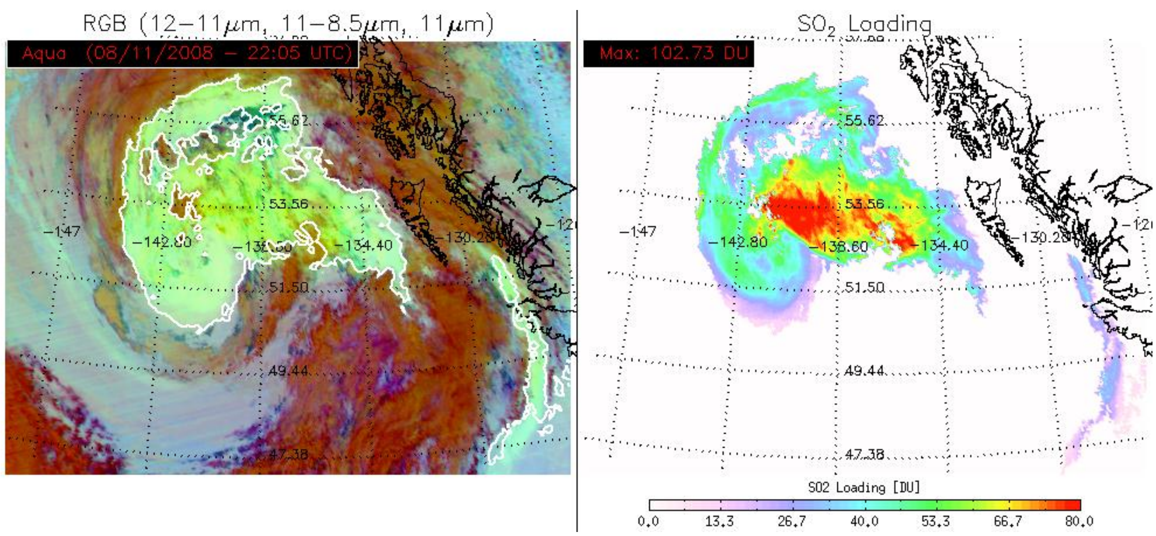

Figure 5: Example GOES-R SO2 products generated using Aqua MODIS data from August 11, 2008 at 22:05 UTC. The SO2 cloud present in this scene is from an eruption of Kasatochi, located in the Aleutian Islands of Alaska. A false color image (left panel) and the estimated SO2 loading (right panel) are shown. The SO2 detection results are displayed as white contours on the false color image.

3.5 Nearcasting Model

A nearcasting model that assimilates full resolution information from the current 18-channel GOES sounder and generates 30 minute to 9 hour nearcasts of atmospheric stability indices will be included in the Aviation Weather Experiment. Products generated by the nearcast model have shown skill at identifying rapidly developing, convective destabilization up to 6 hours in advance. The system fills the 1-6 hour information gap which exists between radar nowcasts and longer-range numerical forecasts. Nearcasting systems must be able to detect and retain extreme variations in the atmosphere (especially moisture fields) and incorporate large volumes of high-resolution asynoptic data while remaining computationally efficient. The nearcasting system uses a Lagrangian approach to optimize the impact and retention of information provided by GOES sounder. It also uses hourly, full resolution (10-12 km) multi-layer retrieved parameters from the GOES sounder. Results from the model enhance current operational NWP forecasts by successfully capturing and retaining details (maxima, minima and extreme gradients) critical to the development of convective instability several hours in advance, even after subsequent IR satellite observations become cloud contaminated.

3.6 Convective Initiation

The UWCI product is being delivered to the AWC as acting GOES-R CI proxy during the Aviation Weather Testbed exercise for iterative feedback from operational forecasters. This input and feedback from operations is critical for improving this experimental product and preparing forecasters for GOES-R CI decision support information.

The UWCI algorithm is an experimental satellite based product used to diagnose and nowcast convective initiation (Sieglaff et al, 2010). The UWCI algorithm uses GOES-East imager data to determine immature convective clouds that are growing vertically and hence cooling in infrared satellite imagery. Additionally, cloud phase information is utilized to deduce whether the cooling clouds are immature water clouds, mixed phase clouds or ice-topped (glaciating) clouds. Currently the algorithm is designed to diagnose/nowcast developing convection. Scenes having a large amount of cirrus (ice) cloud are omitted, these scenes are hoped to be included in future versions of the algorithm.

4 Proving Ground Participants

The Proving Ground participants are broken into two categories, Providers and Consumers. Providers are those organizations that develop and deliver the demonstration product(s) and training materials to the consuming organization. The Consumers are those who work with the providers to integrate the product(s) for demonstration into an operational setting for forecaster interaction. For the Aviation Weather Experiment at the AWC there are four providers, the Cooperative Institute for Meteorological Satellite Studies (CIMSS), NASA Langley, the Cooperative Institute for Mesoscale Meteorological Studies (CIMMS), and NASA’s Short-term Prediction Research and Transition Center (SPoRT). The Aviation Weather Center is the consumer of the aviation related products. This section describes which products each provider is providing and explains the delivery mechanism that will be used.

4.1 CIMSS

CIMSS will be providing the four products demonstrated in the Aviation Weather Experiment and they are described below.

4.1.1 Volcanic Ash: Detection and Height

The volcanic ash products will be generated using near real-time MODIS data acquired from NASA and processed at CIMSS and made available to AWC in a NAWIPS compatible format via an ADDE server.

4.1.2 Low Cloud and Fog

The AWC, the fog/low cloud products will be generated using GOES and near real-time MODIS data acquired from NASA and processed at CIMSS. The products will be made available to AWC in a NAWIPS compatible format via an ADDE server.

4.1.3 SO_2 Detection

The SO2 product will be generated using near real-time MODIS data acquired from NASA and processed at CIMSS and made available to AWC in a NAWIPS compatible format via an ADDE server.

4.1.3.1 Nearcasting Model

Real-time UW-CIMSS NearCasts can be viewed on the web at: http://cimss.ssec.wisc.edu/model/nrc/. Web images are generated using the NWS/NCEP N-AWIPS software system. In addition to producing high quality graphics, these products can be directly included into operational workstations at AWC.

4.1.4 Convective Initiation

The UWCI products are being delivered via a Man computer Interactive Data Access System (McIDAS)-X Abstract Data Distribution Environment (ADDE) server (ADDE group: UWCI, machine name: FLASH.SSEC.WISC.EDU) to the Aviation Weather Testbed (Bruce Entwistle). Bruce receives these files and distributes them internally in a format suitable for display in the NCEP Advanced Weather Interactive Processing System (N-AWIPS) and Warning Decision Support System - Integrated Information (WDSS-II). Two versions of UWCI products are being provided: one that is left in the native satellite viewing projection for overlay atop GOES-12 imagery and another that is parallax corrected for overlay atop WSR-88D radar reflectivity to aid in product validation.

Outputs to be displayed within N-AWIPS:

- Instantaneous box-averaged cooling rate
- Instantaneous cooling rate for each CI pixel within domain. Data range: -4K to -60K
- Instantaneous convective initiation signal
- Value 0: No CI nowcast
- Value 1: "Pre-CI Cloud Growth" associated with growing liquid water cloud
- Value 2: "CI Likely" associated with growing supercooled water or mixed phase cloud
- Value 3: "CI Occurring" associated with cloud that has recently transitioned to a thick ice cloud top

UWCI is also available in AWIPS netCDF and GRIB2 formats. UWCI will be available for GOES West by Fall 2010 and will be in same format as described above.

4.2 SPoRT and CIMMS

SPoRT and CIMMS will provide lightning data for the Aviation Weather Experiment.

4.3 NASA Langley Research Center (LaRC)

NASA LaRC will provide the Aircraft Icing Threat data to the Aviation Weather Experiment.

4.3.1 Aircraft Icing Threat

NASA LaRC will provide the Aircraft Icing Threat data to the Aviation Weather Experiment. The product is being derived every 30 minutes from GOES-E and GOES-W over a large domain encompassing the CONUS and much of Canada and Alaska. It is also anticipated that the LaRC products derived from MODIS north of 60N and including Alaska will be available by the time the experiment is conducted. Data can be made available in McIDAS Area files residing on a NASA LaRC ADDE Server and modified McIDAS copy and display software can be made available that work with the LaRC cloud product AREA files and provide appropriate color bars and legends. However, since the products are being generated on the Columbia supercomputer located at NASA Ames Research Center, and an ADDE server is not available there, it may be more appropriate for NASA LaRC to push the products to the Aviation Weather Experiment directly from Columbia in order to reduce latency in delivery. The data products can also be delivered in NetCDF format. NASA LaRC will provide whatever support is needed to deliver the product in the appropriate format as soon as the requirements are clarified.

4.4 Aviation Weather Testbed

The Aviation Weather Testbed located within the AWC is a consumer and will be receiving the GOES-R like products and rolling them into operations for demonstration and evaluation purposes. The AWC forecasters will use and evaluate the selected GOES-R aviation weather products and provide feedback to the GOES-R Program on product and data performance.

5 Responsibilities and Coordination

5.1 Project Authorization

Steve Goodman – GOES-R Chief Scientist and PG Program Manager
David Bright – NOAA/NCEP/AWC - SOO

5.2 Project Management

Bonnie Reed – NWS/OST
Dick Reynolds – GOES-R
Bruce Entwistle – NOAA/NCEP/AWC

5.3 Product Evaluation

AWC Forecasters

5.4 Project Training

5.4.1 General Sources

GOES-R training is developed and provided by a number of different partners across the weather enterprise. NOAA, collaboratively through NESDIS and the NWS, partners with the Cooperative Program for Operational Meteorology, Education and Training (COMET), Virtual Institute for Satellite Integration Training (VISIT), and Short-term Prediction Research and Transition Center (SPoRT) to develop and deliver training on the new features, operations, and capabilities of the GOES-R satellite. Training for the Aviation Weather PG Experiment will be developed and provided through e-learning training modules, seminars, weather event simulations, and special case studies.

5.4.2 Product Training References

5.4.2.1 Volcanic Ash: Detection and Height

A product description along with examples and caveats will be made available at the beginning of the experiment (in presentation form) by Mike Pavolonis.

5.4.2.2 Aircraft Icing Threat

A product description along with examples and caveats will be made available at the beginning of the experiment (in presentation form) by Bill Smith.

5.4.2.3 Low Cloud/Fog

A product description along with examples and caveats will be made available at the beginning of the experiment (in presentation form) by Mike Pavolonis.

5.4.2.4 SO2 Detection

A product description along with examples and caveats will be made available at the beginning of the experiment (in presentation form) by Mike Pavolonis.

5.4.2.5 Nearcasting Model

Background and initial training materials can be accessed through the CIMSS NearCasting web page at: http://cimss.ssec.wisc.edu/model/nrc/. These materials will be referenced during the Aviation Weather Experiment.

5.4.2.6 Convective Initiation

Training documentation and VISITView training material is provided below. Visitiview training will be recorded to provide UWCI training was conducted before and since 2009 SPC HWT experiment. UW-CIMSS will provide in field training to EWP and EFP participants throughout experiment. Chris Siewert is already knowledgeable about UWCI products and has provided a Wiki web site with in field support.

(1) University of Wisconsin convective initiation strength and weaknesses fact sheet
http://cimss.ssec.wisc.edu/goes_r/proving-ground/GOES_CINowcast.html
(2) UWCI links to training and documentation are available here:
http://cimss.ssec.wisc.edu/goes_r/proving-ground/SPC/SPC.html
(3) VISITView training module (Scott Lindstrom)
http://rammb.cira.colostate.edu/visit/uwci.html
(4) CIMSS Blog case study examples are available: http://cimss.ssec.wisc.edu/

6 Project Schedule

There are many activities that lead up to the successful execution of the Experiment such as identifying participants, coordinating schedules, delivering and integrating algorithms, and developing training materials. These specific activities are identified in the chart below.

(1) Begin: June 2010
   a. Identify products (June 2010)
   b. Identify AWG Leads (June 2010)
   c. Establish an Operations Plan - roles and responsibilities and expectations (August 1)
   d. AWC receives and integrates first GOES-R product (15 December)
   e. Produce demonstration products (see Table 2 below)
   f. Capture and provide Forecaster and user feedback (Dec 2010-Dec 2011)

(2) End: Feb 04, 2010

Below is a table describing the timeline of the integration of products into the AWC.

Table X. AWC Timeline of product integration

Proving Ground Product	Acquisition into Testbed due date	Evaluation Campaign dates
Convective Initiation and Nearcasting	12/15/10	01/02/11-01/15/11
Volcanic Ash: Detection and Height; SO_2 Detection	10/03/11	10/30/11-12/15/11
Aircraft Icing Threat	10/03/11	10/30/11-12/15/11
Low Cloud and Fog	05/16/11	06/06/11-12/15/11

7 Milestones and Deliverables

7.1 Products from Providers

Products to be demonstrated within this year's Aviation Weather Experiment should be delivered to the AWC according to the schedule in Table 2 to insure product dataflow and display work correctly within the forecast programs.

7.2 Training materials from providers

Each product delivered to the GOES-R PG Experiment will be accompanied by related training material. Forecasters and scientists participating in the Experiment may not be familiar with the products; therefore, it is important that they receive training in order to properly evaluate product performance during real-time forecasting exercises. Training may include an in-person briefing and/or a descriptive write-up explaining how the product works and its uses, including example images. It is expected that the product developer or the producer provide the training material.

7.3 Mid-term evaluation report

A mid-term evaluation report shall be provided to the project authorization team roughly halfway through the experiment timeframe. This report shall detail the current status and progress of the GOES-R PG Experiment activities and suggest changes if needed.

7.4 Final report

A final report detailing the GOES-R PG Experiment activities during the entirety of the experiment shall be provided to the GOES-R Program Office in February 2011 from the AWC. These reports will discuss how each product was demonstrated within the various centers. These reports will also present feedback provided by participants within the experiment as well as suggestions for improvements upon the GOES-R PG Experiment activities for years to come.

8 Related activities and methods for collaboration

8.1 GOES-R Risk Reduction Products and Decision Aids

There are two GOES-R Risk Reduction products that will be demonstrated in addition to the Baseline and Option 2 products. The one risk reduction product, Nearcasting Model, is described in Section 3.5.

9 Summary

This year's GOES-R Aviation Weather PG Experiment will support the PG effort to demonstrate the defined GOES-R products within an operational framework through real time access. Feedback gathered from these activities will aid in successful product training for not only forecasters but for the many users of GOES-R products.

10 References

None at this time.